

# PREPARATION AND CHARACTERIZATION OF BETA-LACTAM ANTIBIOTIC AS IONIC LIQUIDS AND SALTS

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With the increase of bacterial resistance a large number of therapeutic strategies have been used to fight different kind of infections.

In recent years ionic liquids (ILs) have been increasing the popularity and the number of applications. First ionic liquids were used mainly as solvent in organic synthesis, but now they are used in analytical chemistry, separation chemistry and material science among others. Additional to significant developments in their chemical properties and applications, ionic liquids are now bringing unexpected opportunities at the interface of chemistry with the life sciences

Ionic liquids (ILs) are currently defined as salts that are composed solely of cations and anions which melt below 100°C. Our goal in this work is to explore the dual activity of the ionic liquids, due to the presence of two different ions, an ion with bacterial activity as a beta-lactam antibiotic and different kinds of cations.

In this work the anions of ILs and salts were derived from three different antibiotics: ampicillin, penicillin and amoxicillin. The cations were derived from substituted ammonium, phosphonium pyridinium and methylimidazolium salts, such as: tetraethyl ammonium, trihexyltetradecylphosphonium, cetylpyridinium, choline (an essential nutrient), 1-ethyl-3-methylimidazolium, and 1-ethanol-3-methylimidazolium structures.

Commercial ammonium and phosphonium halogen salts were first transformed into hydroxides. on ionic exchange column (Amberlite IRA-400) in methanol. The prepared hydroxides were then neutralized with beta-lactam antibiotics. After crystallization we obtained pure ILs and salts containing beta-lactam antibiotics.

This work presents a novel method for preparation of new salts of antibiotics with low melting point and their characterization.

## References:

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